

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Barry L. Berson; Larry J. Bialecki; Peter A. Buck		
Assignee:	Supersonic Aerospace International, LLC		
Title:	Systems and Methods Using Enhanced Vision To Provide Out-the-Window Displays For A Device		
Serial No.:	10/615,634	Filing Date:	July 8, 2003
Examiner:	Hajnik, Daniel F	Group Art Unit:	2671
Docket No.:	SAI.P001 US	KB Ref. No.:	1023.P001 US

Irvine, California
November 16, 2007

MAIL STOP APPEAL BRIEFS - PATENTS
COMMISSIONER FOR PATENTS
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450

APPELLANT'S BRIEF

Dear Sir:

This paper is responsive to the Final Office Action dated August 8, 2007, to which a Notice of Appeal was filed on September 16, 2007. Reconsideration is respectfully requested.

I. REAL PARTY IN INTEREST

The entire interest in the present application has been assigned to Supersonic Aerospace International, LLC, a Nevada Limited Liability Company, having a place of business at 2250 E. Tropicana Avenue, Suite 19-121, Las Vegas, NV 89119, as recorded at reel 014299, frame 0743.

II. RELATED APPEALS AND INTERFERENCES

An Appeal Brief for U.S. Patent Application No. 10/420,117 entitled "System and Method For Customizing Multiple Windows of Information On A Display" is being filed on the same day as the present Appeal Brief. While the scope of the claims differ, some of the claims in the present application and the '117 application include similar elements.

III. STATUS OF CLAIMS

Claims 1-14, 16-39, and 41-47 are pending in the application. Claims 1-14, 16-39 and 41-47 are rejected.

Claims 1-6, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guell *et al.* (NPL Document "FLILO - an Enhanced Vision System", herein referred to as "Guell") in view of NASA *et al.* (NPL Document "NASA's High-Speed Research Program", herein referred to as "NASA") in further view of Snyder (US Patent No. 6,381,519, herein referred to as "Snyder").

Claims 7-11, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guell in view of NASA in further view of Snyder in further view of Bernier *et al.* (US Publication No. 2004/0169663, herein referred to as "Bernier").

Claims 16-19, 24-27, 33, 37, 38, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guell in view of NASA in further view of Sankrithi *et al.* (US Patent 6,405,975, herein referred to as "Sankrithi") in further view of Lipsanen *et al.* (US Publication No. 20020059614, herein referred to as "Lipsanen").

Claims 20-23, 28-32, 34-36, 39, 41-45, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guell in view of NASA in further view of Sandrithi in further view of Lipsanen in further view of Bernier.

Claims 15 and 40 are canceled.

The rejections of Claims 1-14, 16-39, and 41-47 are on appeal.

IV. STATUS OF AMENDMENTS

The appellant's response dated February 5, 2007, in response to the non-final office action dated October 17, 2006, was entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 1 pertains to a display system (50) (400) for a device comprising:

computer executable instructions operable to:

receive images from a first sensor and a second sensor representing scenery outside the device; (54, 56, 58, 60, 62) (FIG. 1A) (specification paragraphs [0024], [0035]-[0043])

detect moving objects in the images; (70) (FIG. 1A) (specification paragraphs [0026], [0045])

fuse the images to a single viewpoint; (72) (FIG. 1A) (specification paragraphs [0046], [0047])

transform the fused image to a first viewpoint image from a first operator station in the device and a second viewpoint image from a second operator station in the device, wherein the first and second viewpoint images conform to the scenery outside the device from each operator station; (76) (FIG. 1A) (specification paragraphs [0048], [0049])

generate a third display area associated with at least two mutually exclusive windows (1A, 1B) of information on a display device (100, 428) for the first operator station; (e.g., window 1C) (FIG. 4A) (specification paragraphs [0053]-[0055], [0057], [0058])

generate a third display area (100) associated with at least two mutually exclusive windows of information on another display device for the

second operator station; (FIG. 4A) (specification paragraphs [0053]-[0055], [0057], [0058])

wherein the third display areas area can be customized independently by the operators to display detailed information related to the information displayed in the associated windows. (e.g., associated windows 1A, 1B; common window 1C) (FIG. 4A), (specification paragraphs [0053]-[0055], [0057], [0058]); (display 600, associated windows 602, 604, common window 606) (FIG. 6), specification paragraphs [0064]-[0066])

Independent claim 16 pertains to a method for providing an out-the-window visual scene on a display device, comprising:

receiving an image of a portion of the out-the-window visual scene from the viewpoint of a first type of sensor; (54, 56, 58, 60, 62) (FIG. 1A) (specification paragraphs [0024], [0035]-[0043])

receiving another image of a portion of the out-the-window visual scene from the viewpoint of another of the first type of sensor; (54, 56, 58, 60, 62) (FIG. 1A) (specification paragraphs [0024], [0035]-[0043])

fusing the images from the first type of sensors into a combined image to generate a first fused image; (72) (FIG. 1A) (specification paragraphs [0046], [0047])

transforming the fused image to a first operator viewpoint and to a second operator viewpoint; (76) (FIG. 1A) (specification paragraphs [0048], [0049]) and

outputting the first operator viewpoint image to a first display device (100) (FIGS. 1B, 4A) and the second operator viewpoint image to a second display device (100) (FIGS. 1B, 4A), wherein the display devices are positioned to provide the portion of a desired out-the window visual scene (102) (FIG. 1B) in combination with a window (104, 106) (FIG. 1B) that provides another portion of the desired out-the-window visual scene, and the viewpoint images are aligned with and scaled to conform to the out-the-window visual scene (76) (FIG. 1A). (specification paragraphs [0024]-[0033]).

Independent claim 24 pertains to a device, comprising:

a display device; (100) (FIGS. 1B, 4A) and

a display processor (52) (FIGS. 1B, 4A) operable to:

receive a first sensor image representing a portion of scenery outside the device; (54, 56, 58, 60, 62) (FIG. 1A) (specification paragraphs [0024], [0035]-[0043])

transform the first sensor image to a viewpoint image from an operator station in the device, wherein the viewpoint image is sized and oriented to conform to the scenery outside the device from the operator station; (76) (FIGS. 1A, 1B). (specification paragraphs [0024]-[0033]) and

output the first operator viewpoint image to the display device, wherein the display device is positioned to provide the portion of a desired out-the-window visual scene (102) (FIG. 1B) in combination with a window (104, 106) (FIG. 1B) that provides another portion of the desired out-the-window visual scene, and the viewpoint image is aligned with and scaled to conform to the out-the-window visual scene (76) (FIG. 1A). (specification paragraphs [0024]-[0033]).

Independent claim 37 pertains to an aircraft, comprising:

a crewstation with cockpit windows (104, 106, 108);

a first display device (100) for one crewmember;

a second display device (100) for another crewmember; and

a display processor (52) operable to:

receive an image of an out-the-window visual scene from the viewpoint of a first type of sensor; (54, 56, 58, 60, 62) (FIG. 1A) (specification paragraphs [0024], [0035]-[0043])

receive another image of a portion of the out-the-window visual scene from the viewpoint of another of the first type of sensor; (54, 56, 58, 60, 62) (FIG. 1A) (specification paragraphs [0024], [0035]-[0043])

fuse the images from the first type of sensors into a combined image to generate a first fused image; (72) (FIG. 1A) (specification paragraphs [0046], [0047])

transform the fused image to a first operator viewpoint and to a second operator viewpoint; (76) (FIG. 1A) (specification paragraphs [0048], [0049])

transform the first operator viewpoint image and the second operator viewpoint image to conform to the size and orientation of the out-the-window visual scene; (76) (FIGS. 1A, 1B). (specification paragraphs [0024]-[0033]) and

output the first operator viewpoint image to the first display device (100) (FIGS. 1B, 4A) and the second operator viewpoint image to the second display device (100) (FIGS. 1B, 4A), wherein the display devices are positioned to provide the portion of a desired out-the-window visual scene (102) (FIG. 1B) in combination with a cockpit window (104, 106, 108) (FIG. 1B) that provides another portion of the desired out-the-window visual scene, and the viewpoint images are aligned with and scaled to conform to the out-the-window visual scene. (76) (FIG. 1A) (specification paragraphs [0024]-[0033]).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether independent claims 1, 16, 24, and 37 and corresponding dependent claims 1-14 are unpatentable over Guell *et al.* (NPL Document "FLILO - an Enhanced Vision System", herein referred to as "Guell") in view of NASA *et al.* (NPL Document "NASA's High-Speed Research Program", herein referred to as "NASA") in further view of Snyder (US Patent No. 6,381,519, herein referred to as "Snyder").

Whether independent claims 16, 24, and 37 and corresponding dependent claims 17-23, 25-26, and 38, 39, 41-47 are unpatentable over Guell in view of NASA in further view of Sankrithi *et al.* (US Patent 6,405,975, herein referred to as "Sankrithi") in

further view of Lipsanen *et al.* (US Publication No. 20020059614, herein referred to as "Lipsanen").

VII. ARGUMENT

Claims 1-6, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guell *et al.* (NPL Document "FLILO - an Enhanced Vision System", herein referred to as "Guell") in view of NASA *et al.* (NPL Document "NASA's High-Speed Research Program", herein referred to as "NASA") in further view of Snyder (US Patent No. 6,381,519, herein referred to as "Snyder"). Applicant respectfully disagrees.

Independent claim 1 recites:

"generate a third display area associated with at least two mutually exclusive windows of information on a display device for the first operator station;
generate a third display area associated with at least two mutually exclusive windows of information on another display device for the second operator station;
wherein the third display areas can be customized independently by the operators to display detailed information related to the information displayed in the associated windows."

In contrast, the cited portions of Snyder do not teach or suggest a display device with a third display area associated with at least two mutually exclusive windows of information. In claim 1, the two mutually exclusive windows of information and the third display area are on the same display device. In Snyder, the cited Figure 5 shows several mutually exclusive windows of information, but there is no third display area in Figure 5 that is associated with at least two of the mutually exclusive windows of information. All of the windows on the display in Figure 5 of Snyder are mutually exclusive. (Snyder col. 5 lines 8-18 teaches individual gages being replaced by a single CRT or LCD display 500 with graphical representations of an attitude indicator, airspeed indicator, altimeter, and horizontal situation indicator). Further, Snyder does not disclose or suggest allowing a crewmember to customize any area of display 500. Snyder only teaches crewmember interaction with display 304 and 306. (Snyder col. 5

line 29 through col. 6 line 55). Claim 1 is distinguishable from the cited references, alone and in combination, for at least these reasons.

Claims 2-14 depend from claim 1 and include features that further distinguish them from the cited references.

Independent claims 16, 24, and 37 and corresponding dependent claims 17-23, 25-26, and 38, 39, 41-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guell in view of NASA in further view of Sankrithi *et al.* (US Patent 6,405,975, herein referred to as "Sankrithi") in further view of Lipsanen *et al.* (US Publication No. 20020059614, herein referred to as "Lipsanen"). Independent claims 16 and 37 recite: "the viewpoint images are aligned with and scaled to conform to the out-the-window visual scene." Independent claim 24 recites: "the viewpoint image is aligned with and scaled to conform to the out-the-window visual scene." These features are supported by at least paragraphs [0048] - [0049] in the specification. In contrast, Sankrithi teaches displaying images of the landing gear, but the landing gear images do not conform to nor are they aligned with the out-the-window visual scene. (Sankrithi col. 3 lines 44-52). Sankrithi does not teach or suggest displaying video images of anything other than the landing gear of the aircraft. (Sankrithi col. 3 line 54 - col. 8 line 22).

Lipsanen is cited as teaching "the viewpoint images are aligned with and scaled to conform to the out-the-window visual scene", however if the images of the landing gear in Sankrithi were scaled to conform to the out-the-window visual scene, only a very small portion of the images of the landing gear would be visible on the crewstation displays. Applicant submits the combination of Sankrithi and Lipsanen would defeat the whole purpose of Sankrithi in aiding a crewmember in ground maneuvering large airplanes. Accordingly, there is no motivation or suggestion to combine Sankrithi and Lipsanen, nor would the combination of Sankrithi and Lipsanen have any reasonable expectation of success.

Further, Lipsanen does not teach that the images are aligned with and scaled to conform to the out-the-window scene. Rather, Lipsanen teaches scaling, zooming, frame rate converting, and filtering as needed to display the video data on display 518.

(Lipsanen para. [0058]). Although Lipsanen mentions outputting video images to a flat panel display or a virtual display such as a head-mounted display, Lipsanen does not teach or suggest that the video images conform to the out-the-window scene. Id.

Further still, the mobile multimedia terminals (MMT) of Lipsanen are for use by passengers, not crewmembers. (Lipsanen para. [0054], FIG. 5 shows diagram for a fixed seatback terminal 500a or passenger carried terminal 500b). The system in Lipsanen is used to distribute digital content to passengers in an airplane cabin. (Lipsanen, abstract). Thus, the suggested combination of references fails to teach all of the elements of claims 16, 24, and 37. Additionally, there is no suggestion or motivation either in Sankrithi or Lipsanen to scale the video images to conform to an out-the-window scene.

Accordingly, independent claims 16, 24, and 37 are distinguishable from the cited references, alone and in combination, for at least these reasons.

Claims 17-23, 25-36, and 38, 39, 41-47 depend from Claims 16, 24, and 36, respectively, and include features that further distinguish them from the cited references.

Allowance of claims 1-14, 16-39, and 41-47 is respectfully requested.

I hereby certify that this correspondence is being transmitted to the USPTO on the date shown below:

/Mary Jo Bertani/
(Signature)

Mary Jo Bertani
(Printed Name of Person Signing Certificate)

November 16, 2007
(Date)

Respectfully submitted,

/Mary Jo Bertani/

Mary Jo Bertani
Attorney for Applicant(s)
Reg. No. 42,321

VIII. CLAIMS APPENDIX

Claims remaining in the application are as follows:

1. (Previously presented) A display system for a device, comprising:
computer executable instructions operable to:

receive images from a first sensor and a second sensor representing
scenery outside the device;

detect moving objects in the images;

fuse the images to a single viewpoint;

transform the fused image to a first viewpoint image from a first operator
station in the device and a second viewpoint image from a second
operator station in the device, wherein the first and second
viewpoint images conform to the scenery outside the device from
each operator station; and

generate a third display area associated with at least two mutually
exclusive windows of information on a display device for the first
operator station;

generate a third display area associated with at least two mutually
exclusive windows of information on another display device for the
second operator station;

wherein the third display areas can be customized independently by the
operators to display detailed information related to the information
displayed in the associated windows.

2. (Original) The display system of Claim 1, further comprising:
computer executable instructions operable to:

combine the first and second viewpoint images with symbols, wherein the
symbols represent information regarding the operational state of
the device and the moving objects detected in the images.

3. (Original) The display system of Claim 1, wherein the instructions for detecting moving objects in the first sensor image are configured to execute in a first processor, and the instructions for detecting moving objects in the second sensor image are configured to execute in a second processor simultaneously with the instructions in the first processor.

4. (Original) The display system of Claim 3, wherein the instructions for transforming the fused image to the first viewpoint image are configured to execute in the first processor, and the instructions for transforming the fused image to the second viewpoint image are configured to execute in the second processor.

5. (Original) The display system of Claim 2, wherein the symbols represent the moving objects in the vicinity of the device.

6. (Original) The display system of Claim 2, wherein at least one of the first and second viewpoint images include environmental information for the area where the device is operating.

7. (Original) The display system of Claim 2, wherein the symbols represent weather hazards in the vicinity of the device.

8. (Original) The display system of Claim 2, wherein the computer executable instructions are further operable to receive an enhanced image from a third sensor configured to provide an image of the out-the-window scenery in low-visibility conditions

9. (Original) The display system of Claim 8, wherein the computer executable instructions are further operable to fuse the single viewpoint image with the enhanced image.

10. (Original) The display system of Claim 9, wherein the computer executable instructions are further operable to utilize data from at least one position sensor to determine the location of the objects with respect to the device.

11. (Original) The display system of Claim 2, wherein the computer executable instructions are further operable to utilize data from off-board data sources regarding the objects.

12. (Original) The display system of Claim 1, wherein the first sensor and the second sensor are video cameras.

13. (Original) The display system of Claim 8, wherein the third sensor is a RADAR sensor.

14. (Original) The display system of Claim 8, wherein the third sensor is a FLIR sensor.

15. (Canceled)

16. (Previously presented) A method for providing an out-the-window visual scene on a display device, comprising:

receiving an image of a portion of the out-the-window visual scene from the viewpoint of a first type of sensor;

receiving another image of a portion of the out-the-window visual scene from the viewpoint of another of the first type of sensor;

fusing the images from the first type of sensors into a combined image to generate a first fused image;

transforming the fused image to a first operator viewpoint and to a second operator viewpoint; and

outputting the first operator viewpoint image to a first display device and the second operator viewpoint image to a second display device, wherein the display devices are positioned to provide the portion of a desired out-the

window visual scene in combination with a window that provides another portion of the desired out-the-window visual scene, and the viewpoint images are aligned with and scaled to conform to the out-the-window visual scene.

17. (Original) The method of Claim 16, further comprising detecting objects in the first fused image from the first type of sensor.

18. (Original) The method of Claim 17, further comprising combining the first fused image with symbols representing the objects.

19. (Original) The method of Claim 16, further comprising transforming the first operator viewpoint image and the second operator viewpoint image to conform to the out-the-window visual scene.

20. (Original) The method of Claim 16, further comprising fusing the first fused image with an enhanced image of a portion of the out-the-window scenery from at least one of the group of a RADAR sensor and a FLIR sensor, to generate a second fused image.

21. (Original) The method of Claim 16, further comprising fusing the second fused image with an enhanced image of a portion of the out-the-window scenery from at least one of the group of a RADAR sensor and a FLIR sensor, to generate a second fused image.

22. (Original) The method of Claim 21, further comprising: transforming the second fused image to the first operator viewpoint and to the second operator viewpoint.

23. (Original) The method of Claim 20, further comprising: providing portions of the transformed image with data from a terrain map database.

24. (Previously presented) A device, comprising:

a display device; and

a display processor operable to:

receive a first sensor image representing a portion of scenery outside the device;

transform the first sensor image to a viewpoint image from an operator station in the device, wherein the viewpoint image is sized and oriented to conform to the scenery outside the device from the operator station; and

output the first operator viewpoint image to the display device, wherein the display device is positioned to provide the portion of a desired out-the-window visual scene in combination with a window that provides another portion of the desired out-the-window visual scene, and the viewpoint image is aligned with and scaled to conform to the out-the-window visual scene.

25. (Original) The device of Claim 24, wherein the display processor is further operable to combine the viewpoint image with symbols, wherein the symbols represent information regarding the operational state of the device and the moving objects detected in the images.

26. (Original) The device of Claim 24, wherein the display processor is further operable to detect moving objects in the first sensor image

27. (Original) The device of Claim 24, wherein the display processor is further operable to generate symbols representing moving objects in the sensor image and the operational state of the device.

28. (Original) The device of Claim 24, wherein the display processor is further operable to generate symbols representing weather hazards in the vicinity of the device.

29. (Original) The device of Claim 24, wherein the display processor is further operable to receive an enhanced image of the out-the-window scenery in low-visibility conditions from a second sensor.

30. (Original) The device of Claim 29, wherein the display processor is further operable to fuse the viewpoint image with the enhanced image.

31. (Original) The device of Claim 26, wherein the display processor is further operable to utilize data from at least one position sensor to determine the location of the objects with respect to the device.

32. (Original) The device of Claim 26, wherein the display processor is further operable to utilize data from off-board data sources regarding the objects.

33. (Original) The device of Claim 24, wherein the sensor is a video camera.

34. (Original) The device of Claim 29, wherein the second sensor is a RADAR sensor.

35. (Original) The device of Claim 29, wherein the second sensor is a FLIR sensor.

36. (Original) The device of Claim 24, wherein the display processor is further operable to generate a common display area associated with at least two mutually exclusive windows of information on the display device, wherein the common display area can be customized by the operator to display detailed information related to the information displayed in the associated windows.

37. (Previously presented) An aircraft, comprising:
a crewstation with cockpit windows;
a first display device for one crewmember;
a second display device for another crewmember; and

a display processor operable to:

receive an image of an out-the-window visual scene from the viewpoint of
a first type of sensor;

receive another image of a portion of the out-the-window visual scene
from the viewpoint of another of the first type of sensor;

fuse the images from the first type of sensors into a combined image to
generate a first fused image;

transform the fused image to a first operator viewpoint and to a second
operator viewpoint;

transform the first operator viewpoint image and the second operator
viewpoint image to conform to the size and orientation of the out-
the-window visual scene; and

output the first operator viewpoint image to the first display device and the
second operator viewpoint image to the second display device, wherein
the display devices are positioned to provide the portion of a desired out-
the window visual scene in combination with a cockpit window that
provides another portion of the desired out-the-window visual scene, and
the viewpoint images are aligned with and scaled to conform to the out-
the-window visual scene.

38. (Original) The aircraft of Claim 37, wherein the display processor is further operable to detect objects in the first fused image from the first type of sensor.

39. (Original) The aircraft of Claim 38, wherein the display processor is further operable to combine the first fused image with symbols representing the objects and primary flight information for the aircraft.

40. (Canceled)

41. (Original) The aircraft of Claim 37, wherein the display processor is further operable to fuse the first fused image with an enhanced image of a portion of the out-

the-window scenery from at least one of the group of a RADAR sensor and a FLIR sensor, to generate a second fused image.

42. (Original) The aircraft of Claim 41, wherein the display processor is further operable to fuse the second fused image with an enhanced image of a portion of the out-the-window scenery from at least one of the group of a RADAR sensor and a FLIR sensor, to generate a second fused image.

43. (Original) The aircraft of Claim 42, wherein the display processor is further operable to transform the second fused image to the first operator viewpoint and to the second operator viewpoint.

44. (Original) The aircraft of Claim 43, wherein the display processor is further operable to provide portions of the transformed images using data from a terrain map database.

45. (Original) The aircraft according to Claim 37 further comprising:
a terrain database coupled to provide the display processor with at least a portion of the required out-the-window field of view on the display device.

46. (Original) The aircraft of Claim 37, wherein the display processor is further operable to display one of the operator viewpoint displays to the operator acting as pilot in command of the aircraft during a predefined aircraft operational state, and to allow the pilot in command to choose an option on the display device to view detailed information about the aircraft and aircraft subsystems during other aircraft operational states.

47. (Original) The aircraft of Claim 46, wherein the display processor is further operable to generate a common display area associated with at least two mutually exclusive windows of information on each display device, wherein the common display area can be customized by the operator to display detailed information related to the information displayed in the associated windows.

IX. EVIDENCE APPENDIX

None.

X. RELATED PROCEEDINGS APPENDIX

None.